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IN REPLY REFER TO: OC 8-10

August 12, 1983

Mr. Milton Rosen
Executive Director
Space Applications Board
National Research Council
2101 Constitution Avenue
Washington, D. C. 20418

Dear Milt:

I enjoyed meeting you at the recent meeting of the Committee on Practical Applications of Remote Sensing. During the discussion you mentioned that you would like a copy of John McElroy's paper on commercialization, which I am enclosing.

Looking forward to seeing you again at the October meeting.

Sincerely,

Allen H. Watkins
Chief, EROS Data Center

Enclosure

cc: LAHW Subj
AHW Chron
EDC Chron

AHWatkins/jis/8-12-83/x123

COMMERCIALIZATION OF THE
CIVIL SPACE REMOTE SENSING SYSTEMS

- A Review

September 1982

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*Assembled by John H. McElroy, Assistant Administrator for Satellites,
National Oceanic and Atmospheric Administration, August 1982

This document brings together in a single place the principal policy statements and issues related to commercialization of the civil space remote sensing systems. It also provides background information and a brief discussion of the process that is under way to reach a decision on these matters.

It is not the intent of this document to be all inclusive; it is only intended to summarize some of the major points of discussion that will need to be addressed in the future, and to serve as a starting point for a person concerned about these matters. Likewise, although almost any sentence can be construed by some reader to indicate a bias toward one side or the other of an issue, this paper is intended to assist in an objective review of all of these issues without a preconceived answer to any. When points of concern are raised, it is not assumed that solutions are impossible--only that these are aspects which require attention in any proposed decision.

The first three sections of the paper provide review material on past decisions on space policy and an excerpt from the Outer Space Treaty which is germane to the discussion. The next two sections discuss present thoughts on what the proper role of the Federal Government is vis-a-vis the private sector. They are followed by three sections concerning various elements of oversight or regulation that might be placed on a private sector supplier of remote sensing data.

The succeeding three sections bring together some thoughts on how a private entity might provide support to Federal needs--whether through partial or full commercialization, in a monopolistic or laissez-faire environment, what guarantees are necessary, and what would influence or control data prices.

The final two sections concern the path by which a decision will be made and ratified.

COMMERCIALIZATION OF THE CIVIL SPACE REMOTE SENSING SYSTEM

- A Review

I. INTRODUCTION

The civil space remote sensing systems include the land remote sensing, polar-orbiting environmental (weather), and geostationary environmental satellites. There are five operational satellites in orbit and eight satellites in various stages of manufacture, test, or storage. The systems also include data processing and distribution facilities at Greenbelt, Maryland; Suitland, Maryland; Camp Springs, Maryland; and Sioux Falls, South Dakota; and tracking facilities at Gilmore Creek, Alaska, and Wallops Island, Virginia. The acquisition costs for this equipment were nominally \$1.6 billion, not including initial research and development or the costs of preceding satellites in either the land or environmental series.

The central issue that now has spanned two Presidents' Administrations is whether all or any part of this complex of systems should be transferred from the Government to private ownership. The Carter Administration initiated the examination of the issue, but elected to limit commercialization to the land satellites; the current Administration reiterated the Carter position on land satellites and added the environmental satellites to the examination. The following sections will review the issues and options associated with such a transfer, and recent processes that have been initiated to address those issues.

II. SPACE POLICY BACKGROUND

President Carter's decision on operational civil space remote sensing was the result of a two-year review of the nation's space policy. This effort included the formation of the Policy Review Committee (PRC) on Space as the senior interagency body to coordinate space matters, to replace the Under Secretaries Committee (chaired by State) that was used as the policy coordinating body under the Nixon and Ford Administrations. In May 1978, President Carter announced that the United States would encourage domestic commercial exploitation of space capabilities under appropriate U.S. authorization and supervision. In October 1978, the President made a commitment to ensuring continuity of land sensing data, and reiterated that commitment in his March 1979 Science and Technology message.

From October 1978 through the summer of 1979, the Executive Branch examined a range of issues including the potential for integrating civil and military space remote sensing systems and greater private sector involvement in those systems. This examination led to a Presidential directive issued in November 1979 that provided the framework for civil operational remote sensing (see Appendix A). The chief policies stated by the directive were:

- o Assignment of the Federal management role for civil space remote sensing to the National Oceanic and Atmospheric Administration (NOAA).

- o Continuation of separate military and civil polar-orbiting environmental satellites.
- o Establishing a goal of eventual transfer to the private sector of the land remote sensing system.
- o Commitment to continuity of land remote sensing data through the 1980s.

This process is described in greater detail in the NOAA document describing the conclusions of the Satellite Task Force.¹

Shortly after President Reagan entered office, it was announced that the Administration would terminate the commitment to land sensing satellite data continuity through the 1980s on the basis that:

It is the Administration's judgment that the present NASA investment in Landsat is sufficient to permit evaluation of operational uses of Landsat data and, if these uses are cost effective, to attract a private sector owner/operator.

NASA's program to develop, launch, and test the two additional satellites already in manufacture (Landsat D and D') will continue as previously planned. Expansion and extension of the U.S. civil land remote sensing program, beyond that already funded by NASA, is inconsistent with the need for across-the-board fiscal restraints....

The two additional satellites, frequently referred to as Landsat D" and D'", then were deleted from the budget.

In response to an inquiry from a private firm the Administration then elected to widen the discussion of commercialization to include the civil weather satellites. The addition of the civil weather satellites increased the complexity of the process. The then Deputy Director of the Office of Management and Budget asked the Cabinet Council on Commerce and Trade (CCCT), a senior Cabinet-level policy-making body chaired by the Secretary of Commerce, to address two issues (Appendix B):

1. What is the best mechanism to implement the current policy of transfer of civil land remote sensing systems (Landsat) to the private sector as soon as possible?
2. Should the Administration consider simultaneously private sector transfer of both civil weather and land remote sensing systems?

The CCCT has met a number of times on these issues, seeking additional information and impact analyses, but has not yet forwarded a recommendation to the President. The Chairman of the CCCT is expected to do so after he has reviewed private sector views on these issues.

In parallel with the CCCT activities, the Department of Commerce formed an advisory committee representing a wide cross-section of non-Federal experts on space remote sensing including members of the business and investment community (see Appendix C) to advise the Secretary on commercialization of the Landsats. In addition, an interagency group was formed--the Program Board on

Civil Operational Land Remote Sensing from Space--so that other agency views could be expressed to the Secretary. The charter of the Program Board is given in Appendix D. Also in parallel, the President's Office of Science and Technology Policy (OSTP) was chartered to develop the Administration's space policy.

The advisory committee met in June 1982 to review the status of the Landsats and plans for commercialization. The Secretary, also asked them to review the weather satellites, as another means of collecting private sector views. The committee passed two resolutions (see Appendix E); the chief one was a recommendation that the Secretary formally solicit industry's inputs so that they would have a base of information from which to develop their recommendations. This recommendation has been accepted by the Secretary and a formal Request for Information (RFI) for publication in the Commerce Business Daily (CBD) has been coordinated with all affected Federal agencies and published (see Appendix F). A more detailed review of that process is given later in Section XIII.

On July 4, 1982, President Reagan announced his space policy. It defines the Department of Commerce role by stating (see Appendix G):

The Department of Commerce, as manager of Federal operational space remote sensing systems, will: (1) aggregate Federal needs for these systems to be met by either the private sector or the Federal government; (2) identify needed research and development objectives for these systems; and (3) in coordination with other departments or agencies, provide regulation of private sector operation of these systems.

The Policy addresses the private sector role in stating:

The United States Government will provide a climate conducive to expanded private sector investment and involvement in space activities. These space activities will be authorized and supervised or regulated by the government to the extent required by treaty and national security.

The policy also establishes a Senior Interagency Group (SIG) for Space for interagency coordination and policy development. It replaces the PRC(Space) of the Carter Administration. Chaired by the President's National Security Advisor and made up of the Deputy Secretaries of key Departments, it is likely to become a forum for national security and foreign policy issues related to civil remote sensing. The formation of the SIG(Space) denotes an elevation of the review of space matters well above that used in past Administrations.

III. OUTER SPACE TREATY

In addition to the national policies reviewed above, the United States is a signatory to the Multilateral Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies--commonly referred to as "The Outer Space Treaty." Article VI states:

States parties to the Treaty shall bear international responsibility for national activities in outer space...whether such activities are carried on by governmental agencies or by non-governmental entities....

The activities of non-governmental entities in outer space...shall require authorization and continuing supervision by the appropriate State Party to the Treaty.

This article appears to mandate, as a matter of treaty obligation, regulation of activity in space by private entities, although the terms "authorization" and "continuing supervision" are subject to interpretation.

The discussion then provides one context for the previously quoted statement from President Reagan's Space Policy which refers to private sector space activities being "authorized and supervised...by the government to the extent required by treaty and national security." It also provides one of the rationales for establishing a single Federal focal point for the management and regulation of a private sector entity.

IV. FEDERAL VERSUS PRIVATE ROLES IN RESEARCH AND TECHNOLOGY

The President's OSTP used the Annual Science and Technology Report to the Congress: 1981² to outline basic principles for Federal involvement in research and technology. Among other principles:

...there is less justification for a dominant Federal Government role in near-term applied research and, especially, development, except in such areas of primary Federal responsibility as defense, space, and environmental regulation, and in heavily regulated technologies. Other areas in which the Government has a more limited role to play include those of shared responsibility...where the broad societal benefits justify Federal involvement and those areas of development where the Government is the sole or dominant buyer.

Thus, commercialization does not rule out continued mission-related applied research and development on civil space remote sensing by Federal agencies. This is particularly germane to future advanced research and development in space applications by NASA, satellite meteorology in NOAA, satellite-aided mapping in the Department of Interior's United States Geological Survey (USGS), and others.

At the other extreme, essentially no Federal role is permitted by this policy in non-mission-related research and development--or activities which could be construed as product-related and unconnected to agency requirements. Such activities are left exclusively to the private sector.

V. FEDERAL VERSUS PRIVATE ROLES IN OPERATIONS

The fundamental principle upon which Government policy is based is that the Government should not compete with its citizens. This policy was first articulated in 1955. The current guidelines for implementing this policy are contained in OMB Circular A-76, which states that the Government should not engage in commercial or industrial activities where the private sector can provide them more efficiently and cheaply. The circular, and the implementing guidelines derived from it by the Federal agencies, gives procedures for the acquisition of commercial or industrial products and services needed by the Government.

Four key paragraphs in this Circular are relevant to these discussions:

Purpose - This Circular establishes the policies and procedures used to determine whether needed commercial products and services should be obtained by contract with private sources or in-house using Government facilities and personnel.

Policy - The Federal Government shall rely on competitive private enterprise to supply needed commercial products and services.

A Government commercial activity is a function operated and managed by a Federal executive agency and providing a product obtainable from a private source.

A Private commercial source is a private business, university, or other non-Federal activity...which provides a commercial product or service required by Government agencies.

The Circular provides in its appendix "a representative, but not comprehensive" listing of such activities. Listed below are the section headings - in the Circular's list:

- Audiovisual Products and Services
- Automatic Data Processing
- Maintenance, Overhaul, and Repair
- Systems Engineering, Installation, Operation, and Maintenance
- Manufacturing, Fabrication, Processing, and Packaging
- Real Property
- Industrial Shops and Services
- Health Services
- Transportation
- Printing and Reproduction
- Research and Development
- Office Services
- Security
- Food Services
- Other Services

Some situations are covered by straightforward application of A-76 procedures. For example, if a Federal agency required maintenance services and either has a civil service staff in place or would have to establish one, the comparison between that mode and employing a private contractor is easily accomplished-at least in principle. In another instance, a comparison can be made between a Federal agency's continuing to use in-house printing facilities and contracting for those services from a private firm. The civil remote sensing systems are far more complex than these examples.

A recent paper³ by two private sector authors suggests that the Government policy must be even more aggressive than might be interpreted from the A-76 guidelines. They suggest it is not sufficient to avoid competition with private entities (who are presumed to have existing personnel and facilities capable of carrying out the task), but that it must also create the capabilities in a firm, transfer to it the equipment necessary to carry out the

activity, and allow sufficient time for the firm to hire or train the people needed for the activity. This would be a much stronger interpretation of OMB Circular A-76 than has been taken in the past, and would indeed denote a significant policy shift if adopted.

One aspect of the above issue is whether the Government is obliged to pass beyond a contractual arrangement in which Government property is used by a contractor (if needed) under normal Government-furnished equipment (GFE) provisions, or to move to the creation of a profit-making entity through transfer of ownership of Government assets. If the latter process is undertaken, it immediately raises the further issue of how to set a price on Government assets. As noted in the introduction to this paper, the acquisition cost of the current physical assets was \$1.6 billion. Replacement costs--taking into account inflation in the years since a given item of equipment was purchased--would be a higher value. Assessed value of the assets--taking into account age of the equipment and depreciation--would presumably result in a third price. One alternative to any of these assessment approaches would be to treat the Government assets as "sunk costs" and ask no price at all--as a means of minimizing the financial burden on a private firm. Another alternative would be to employ an adjusted rate schedule for data purchases to allow the Government some recoupment over a period of years for its investment without creating the need for large initial financing by the firm. Obviously transferring Government property to a private firm without recovering fair market value could be characterized as subsidization. Finally, no current legislative authority permits carrying out such a transfer.

VI. FACTORS APPLICABLE TO REGULATION OF LAND AND ENVIRONMENTAL SATELLITES: DATA USES

The Landsat system provides data which are used by Federal agencies, but also by other domestic and foreign users as well. While the data are important to present users, brief interruptions in data services do not carry the potential for catastrophic impact, because they are not critical to protection of life and property. Further, a nominal 50 percent split exists between Federal and other users--thus, a significant non-Federal market exists. Also, projections exist for a substantial growth in the non-Federal market as applications become proven. Therefore, the combination of the lack of a catastrophic impact and the desire to not hamper the potential market growth militates toward a minimal regulatory regime.

The environmental satellites, on the other hand, provide hurricane and severe storm data for the development of public warnings. They also provide data to forecasters in the National Weather Service, Department of Defense, and the international community. The potential effect of interruptions or changes in service on public health and safety, national security, and foreign relations is quite different from that which would result from similar changes in the Landsat system. Finally, nominally 95 percent of the data is delivered to Federal agencies. In spite of the data also being available to the private sector at no cost for some twenty years (and thus relieving private industry of any need to fund the high-cost part of the system), no substantial value-added industry has developed or is projected for weather products. Thus, even if modest growth is attained in the private sector, Federal needs will dominate the system and its character for the foreseeable future. For the above reasons, the regulatory regime for the environmental satellites could not be as minimal as that for the Landsat system.

VII. FACTORS APPLICABLE TO REGULATION OF LAND AND ENVIRONMENTAL SATELLITES:
NATIONAL SECURITY CONSIDERATIONS

For Landsat, and the follow-on missions that a private sector entity might propose, the sensing parameters must be screened to ensure that they do not disclose militarily sensitive information or technology. The capabilities of the sensing system that might be reviewed include: spectral resolution, center frequency, and tunable range; spatial resolution; geographic coverage; timeliness of data availability, tasking procedures and controls, etc. It is likely that a regulatory regime would be proposed for prior approval of such characteristics. Clearly the issue becomes more complex if a private firm is foreign-owned or a multi-national enterprise.

National security considerations must, however, be tempered in the regulatory process. Due regard must be given to the market in which the private entity is operating. Sensor characteristics must be such that a private entity's competitive position is, at a minimum, maintained in the remote sensing market. National security considerations must be weighed against competition from satellite systems such as SPOT or ERS-1 when reviewing sensing parameters. Standards must not be set that would erode seriously a private entity's ability to compete successfully in the satellite remote sensing market.

For the environmental satellites, there is the broad set of issues related to service by the satellites to the Department of Defense (DoD). This has three aspects: (1) priority service to DoD under either normal circumstances or emergencies, (2) denial of civil satellite use to hostile powers, and (3) transfer of command and control of the civil satellites to DoD in Presidentially-declared emergencies. Although the role of the civil satellites is frequently referred to as that of a backup to the Defense Meteorological Satellite Program (DMSP), the activity is an integral part of DoD weather forecasting and not only a backup.

The relationship between defense and civil weather satellite systems requires flexibility and responsiveness. Satellites are only one element, although an important one, of global cooperative weather observing and forecasting systems. Best utilization of that system involves control and modification of criteria for satellite replacement (i.e., what instrument failure or combination of failures necessitates replacement), orbital parameters (to fit the need of synoptic analyses or other requirements), and satellite instrument complements. The civil and military polar-orbiting satellite systems currently share the use of the same satellite design, although the instrument complements flown on the satellite differ, and interlocked shared data processing systems are being implemented to reduce overall costs. The Government must influence the above items--particularly such critical parameters as equator crossing time. Unilateral control of instrument, satellite, or orbital parameters by a private firm could adversely affect operations extending well beyond the weather satellites. Changing circumstances in either the military or civil systems can require rapid changes--and often in an unpredictable manner that cannot be anticipated in simple data purchase contracts. This paragraph is not intended to state that commercialization of the civil weather satellites is impossible--only that the freedom of action of a private firm is likely to be restrained.

These considerations, for both the land and environmental satellites, introduce an element of supervision that will be required in any commercialization of the civil remote sensing satellites.

VIII. FACTORS APPLICABLE TO REGULATION OF LAND AND ENVIRONMENTAL SATELLITES:
INTERNATIONAL RELATIONS CONSIDERATIONS

In addition to the principles stated in the Outer Space Treaty earlier, a number of concepts have guided United States space remote sensing activities: (1) The U.S. does not agree to the principle, often raised in the United Nations, of the right of prior consent--in which permission of the sensed state would be required prior to data being taken by a sensing nation or disseminated to a third nation. (2) The U.S. endorses the concept of public, timely, non-discriminatory data dissemination to all nations. (3) The U.S. does not endorse the concept of a remote sensing satellite system to be managed by the United Nations, although bilateral or multilateral cooperative efforts in this and other areas of space activities have customarily been endorsed. (4) The U.S. participates in the free international exchange of weather data, including weather satellite data, which provides global data vital to the national defense and commercial interests of the U.S. and our major allies.

A foreign policy objective of the U.S. is the encouragement of international acceptance of the U.S. space remote sensing activities--both civil and those related and critical to national security. This has been fostered through the open dissemination of Landsat data for only the cost of reproduction. It has also been fostered by an aggressive policy of sharing the benefits of civil remote sensing technology with other countries. Indeed, President Nixon, in describing the Landsat program to the United Nations General Assembly in 1969, said, "This program will be dedicated to producing information not only for the United States but also for the world community."

International cooperation in weather satellites is even more extensive than in Landsats. While the Landsats provide direct broadcast (unencrypted) readout of data to 11 nations--as well as openly distributing all processed data--the weather satellites openly broadcast their data to nearly a thousand stations in more than 100 countries. A cooperative geostationary satellite network has been established in which two U.S. satellites are flanked by satellites provided by the European Space Agency, Japan, India, and eventually the USSR. Processed weather data from all sources are distributed to over 150 countries participating in the United Nation's World Meteorological Organization. These data distributions are without cost to the user, and in exchange the U.S. receives surface-derived weather data from these nations, also without cost.

While the above international policies could be revised, it is evident that they have served the U.S. well. It is also evident that a private firm cannot be permitted complete autonomy in changing these relations if the systems were commercialized. Instead, protecting the interests of the U.S. would require supervision from the perspectives of maintaining good relations with other countries, securing acceptance of U.S. activities in space, and maintaining the global flow of all weather data.

IX. COMMERCIALIZATION OPTIONS

Commercialization options for the civil remote sensing satellites can involve all or any part of either system. In a broad sense, commercialization can encompass any of the following stages (the stages accumulate from top to bottom):

- o Value-added services (already partially commercialized)
- o Data processing and distribution
- o Spacecraft tracking and data acquisition
- o System ownership and operation

The Landsat and environmental satellites can be placed on a parallel or a joint option ladder. A further option ladder would encompass a similar series of options that would culminate in operation of the entire system on behalf of the Government, but with no transfer of ownership. These options are discussed in greater detail in the report of the interagency group on private sector involvement in civil space remote sensing.⁴

X. SUBSIDIES, CROSS-SUBSIDIES, GUARANTEES, AND PRICES

One of the most controversial issues surrounding commercialization is that of subsidies. Subsidies could be in a variety of forms: direct cash subsidy payments; Federal loans or loan guarantees; guaranteed Federal purchases of data services at a volume higher than demand projected by Federal users; Federal purchases at a unit price significantly higher than charged to other users; provision of free services, such as satellite launches; special tax incentives; or other. The Administration opposes subsidies to commercialize civil remote sensing on several grounds.

- o Any form of subsidy (whether increasing cash outflow or reducing revenues) is opposed on the basis of budgetary impact on the efforts to balance the budget.
- o Subsidies in this area would set undesirable precedents in other areas.
- o If a commercial initiative cannot stand the test of the marketplace, it should not be established at all.

The limited market for Landsat data, combined with the possible competition from remote sensing systems owned by or subsidized by foreign governments, has, in the past few years, led to industry's conclusion that the Landsat system cannot be commercialized without a substantial subsidy (in some form) for at least the initial years of a private initiative. The amount and type of the suggested subsidy have varied from company to company, and is usually tied to other policy issues such as the system owner's proprietary rights to data, continued Federal R&D, avoidance of competition from government systems, changes in historical government policies on distribution of data, and other matters.

The Administration's FY 1982 and 1983 budgets contain two land remote sensing thrusts: (1) Major Federal user agencies have requested modest funds to purchase Landsat data, and (2) NASA will continue a low level R&D effort

on new sensors. This budget approach implements the OMB position that, if Landsat's commercialization cannot be accomplished without subsidy, the Government will terminate its land remote sensing program with the demise of Landsat D and D'.

The issue of subsidies is, however, linked to national benefits from continuing a U.S. civil satellite land remote sensing capability. It is clear that there are significant national benefits, although their dollar value is debatable. Existing analyses project annual national benefits between a few hundred million dollars and a high of ten billion dollars. Differences in these estimated benefits are caused by different assumptions on U.S. remote sensing capabilities (e.g., two studies assumed 80-meter resolution, and one study assumed 10-meter resolution).

It is also recognized that the Landsat program provides intangible benefits to the nation--benefits that cannot be measured in terms of dollars. These benefits include: contributing to important national and international space policies; promoting vigorous U.S. energy, minerals, and agricultural industries; improving the management of resources on public lands; and supporting the national security interest of the nation.

For a more complete discussion of the tangible and intangible benefits from a continued U.S. land remote sensing system, see Appendix H.

Although subsidies to a commercial land remote sensing system are opposed by the Administration, subsidizing a private venture may be more economical in the long term than continuing the program within the government, if continuing the U.S. capability is determined to be sufficiently important from the national perspective.

The need for subsidies to a commercial supplier of weather satellite data is not as well understood as the needs in the land remote sensing program. Only one major firm has thus far suggested commercializing the weather satellite system, and insufficient information has been provided to project either savings or the need for a direct subsidy.

The Administration advocates the policy that users should bear the full cost of services supplied. The Departments of Commerce and Defense follow this policy in that they, as the dominant users of weather satellite data, seek all the funds needed to provide weather satellite data services through the appropriations process. Likewise, the major Federal users of Landsat data are seeking appropriations to purchase Landsat data starting in fiscal year 1983. Any proposition to commercialize the civil satellite remote sensing systems which requires higher revenues from the Federal users of data from one system (such as the weather satellites) to finance the development of the other system (such as the land resources satellites) appears to be contrary to this policy. It is a cross-subsidy that would be opposed by the agencies whose data costs would be increased to support those of another agency (e.g., the cost to the National Weather Service for weather satellite data could be increased to support the Department of Agriculture's need for Landsat data).

All of the above obviously relates directly to the issue of data prices. Should a firm be allowed to charge whatever it chooses for weather data? Should there be a regulated rate structure for land and/or weather data analogous in some respects to telephone or utility rate structures? These are all interlocked and highly controversial issues.

XI. INSTITUTIONAL ALTERNATIVES, MONOPOLIES, AND DESIGNATED ENTITIES

Irrespective of how the other issues above are resolved, ultimately if commercialization occurs an institutional framework must be created. Some of the issues related to such a framework are addressed in a transition plan developed for Landsat by NOAA.⁵ Among the options identified were:

- o Private corporation
- o Legislatively established for-profit private corporation
- o Government corporation
- o Federal agency ownership with private sector operation

Related to the issue of institutional framework, is whether a monopoly should be established (de jure or de facto) and a designated entity created to serve Federal needs. If the Government transfers all civil satellite assets to one firm, can another firm compete against that firm successfully? Is a purely laissez-faire environment desirable to promote competition and also satisfactory to ensure the availability of weather data? How is the international interface accommodated? Are the answers to these questions different for land and weather satellites? What mechanism can be implemented to prevent a monopolistic entity from arbitrarily increasing prices for weather data upon which the Government is dependent?

XII. THE CONGRESS

The Congress has continued to show an increasing interest in all of the above topics. A lengthy history of legislative hearings is on the record of both the Senate and the House of Representatives. The tenor of those hearings can be sampled in a recent committee print entitled, "Civil Land Remote Sensing System," prepared by the House Subcommittee on Space Science and Applications.⁶ The Congress is obviously intent on following this subject closely.

Clearly, the process of developing legislation to implement any transfer of civil satellites and remote sensing responsibilities will be fraught with controversy about both the substance of legislation and the locus of jurisdiction over such legislation. The number of concerned Congressional committees and subcommittees may be large. Numerous competing views have already been expressed in past hearings, and they will multiply rather than decrease in the future.

XIII. PROCESS AND FUTURE ACTIONS

The announcement shown in Appendix F was published on September 10, 1982. Forty-five days later, on October 22, industry views are due. In parallel, two committees will review those responses. One committee will be selected from the private sector advisory committee listed in Appendix C. A second committee will be assembled from representatives of concerned Federal agencies. The private sector advisory committee will meet later to review the work of its subcommittee and formulate recommendations to the Secretary of Commerce. The Secretary will also be briefed by the Government committee and then formulate the next steps, which may include reconvening the CCCT. It appears that the earliest that the CCCT can meet on this subject to consider these inputs will be late in 1982. It is expected that the CCCT will provide a recommendation to the President, which if approved would in turn lead to the next steps toward commercialization--especially the formulation of proposed legislation.

REFERENCES

1. Satellite Task Force, "Planning for a Civil Operational Land Remote Sensing Satellite System: A Discussion of Issues and Options," NOAA, Department of Commerce, June 20, 1980.
2. OSTP and NSF, Annual Science and Technology Report to the Congress: 1981. U.S. Government Printing Office: Washington, 1982.
3. Dennis J. Burnett and Paul M. Maughan, COMSAT, "Commercialization of U.S. Civil Remote Sensing Satellite Systems," 1982.
4. Interagency Task Force Report, "Private Sector Involvement in Civil Space Remote Sensing," June 15, 1979.
5. NOAA, "Transition Plan for Civil Operational Land Remote Sensing from Space," June 1980.
6. Subcommittee on Space Science and Applications, "Civil Land Remote Sensing System," U.S. House of Representatives. U.S. Government Printing Office: Washington, 1982.

C O P Y

FOR IMMEDIATE RELEASE

November 20, 1979

Office of the White House Press Secretary

THE WHITE HOUSE

The President today announced the designation of the Commerce Department's National Oceanic and Atmospheric Administration (NOAA) to manage all operational civilian remote sensing activities from space. This designation is one of several policy decisions announced today after a review of civilian space policy mandated by a Presidential Directive in October, 1978.

Early in his administration, the President directed a comprehensive review of space policy. The review, completed in May, 1978, resulted in a Presidential Directive that established a national space policy framework. It created a Policy Review Committee on Space, chaired by the Director of the Office of Science and Technology Policy, Frank Press. One of the tasks of the Policy Review Committee has been to assess the Nation's future civil space remote sensing requirements. That review was the basis for the policy decisions announced today.

Designation of a single agency, NOAA, to manage all civil operational satellite activities will lend itself to further integration and potential cost saving in the future. NOAA's experience in successfully operating and managing three generations of weather satellites prepares it to assume the responsibility for land remote sensing in addition to its ongoing atmospheric and oceanic activities. NOAA's first action will be to develop a transition plan in coordination with other appropriate agencies for moving to a fully integrated satellite-based land remote sensing program.

Initially, our operational land remote sensing efforts will rely on experience derived from the LANDSAT program. LANDSAT was begun in 1972 by NASA as a satellite effort specifically designed to observe surface features of the earth.

The President's decision established a three part framework to serve remote sensing activities:

- Integration of civilian operational activities under NOAA.
- Joint or coordinated civil/military activities where both parties' objectives can be best met through this approach.
- Separate defense activities which have no civilian counterpart.

Other space policy decisions developed by this review and announced today are:

-- The Commerce Department will seek ways to further private sector opportunities in civil land remote sensing activities, through joint ventures with industry, a quasi-government corporation, leasing, etc., with the goal of eventual operation of these activities by the private sector.

-- We will continue the policy of providing LANDSAT data to foreign users, and promoting development of complementary and cooperative nationally operated satellite systems so as to increase benefits for all nations.

-- The Department of Commerce will establish and chair a Program Board for continuing federal coordination and regulation of civil remote sensing activities. The involved federal organizations will be represented (i.e., the Departments of Defense, Interior, Agriculture, State, Transportation, and Energy, and NASA, CIA, AID, and EPA). The National Governors' Association and the National Conference of State Legislatures will be invited to participate.

-- Separate weather programs for the military and civil sectors will be maintained under the Departments of Defense and Commerce because of their differing needs. We will continue procurement of current spacecraft until development of a new system design is justified. Future polar orbiting satellite development and procurement will be jointly undertaken by Defense, Commerce and NASA to maximize technology-sharing and minimize cost.

-- Ocean observations from space can meet common civil and military data requirements. Accordingly, if we decide to develop ocean satellites, joint Defense/Commerce/NASA management of the program will be pursued.



EXECUTIVE OFFICE OF THE PRESIDENT

Appendix B

OFFICE OF MANAGEMENT AND BUDGET

WASHINGTON, D.C. 20503

July 13, 1981

MEMORANDUM TO: CRAIG FULLER / MARTIN ANDERSON

FROM: Ed Harper *EH*

SUBJECT: Resolution of Issues Related to Private Sector
Transfer of Civil Land Observing Satellite Activities

The purpose of this memo is to request that a working group within the Cabinet Council system be established to consider the following two issues related to private sector transfer of civil land observing satellite activities:

- What is the best mechanism to implement the current policy of transfer of civil land remote sensing systems (LANDSAT) to the private sector as soon as possible?
- Should the Administration consider simultaneously private sector transfer of both civil weather and land remote sensing systems?

Background

With the revisions to the 1982 Budget the Administration explicitly stated its intention to hand-off operational responsibilities for land remote sensing to the private sector in the mid-1980's or sooner, if possible. This policy reflected the judgment that the Federal investments in the LANDSAT program contained in the revised budget were sufficient to evaluate the usefulness of this data and that, if the operational uses were significant, the private sector would provide follow-on satellites--there would be no need for the Federal Government to purchase additional satellites beyond the two new NASA budgeted satellites (i.e., LANDSAT D and D1). Thus, the Administration withdrew the Carter commitment to data continuity through the end of the decade and decided that additional satellites beyond the two new NASA satellites would depend on the private sector's willingness to invest in and operate follow-on satellites. We are not asking the Cabinet Council to revisit this policy.

The Department of Commerce (NOAA) is currently developing draft legislation designed to facilitate private sector transfer of land observing satellite activities. This legislation needs to be consistent with the policy decisions on the issues being referred to the Cabinet Council.

A potential private sector owner/operator has requested that the Administration consider transferring simultaneously both the civil weather and land remote sensing satellite systems to the private sector, and that selection of a private sector proposal or combination of proposals be based on the merits of the total package.

Discussion of Issues

- o What is the best mechanism to implement the current policy of private sector transfer, as soon as possible? The options available to the Administration seem to be the following:
 - Laissez-faire approach--continue NOAA operation of satellites consistent with current policy and do nothing to encourage or discourage independent private sector initiatives.
 - A decision to consider transferring the current Government inventory of civil remote sensing satellites and ground equipment to a private corporation or consortium of private corporations in return for cash and/or future considerations.
 - A decision to provide some form of subsidy or long-term data contract (details to be specified consistent with budget of user agencies) in order to facilitate private sector transfer.
 - A combination of the two previous options.
 - A decision to establish a federally chartered for-profit private corporation to own and operate a civil, land remote sensing satellite system--along the lines envisioned in the Schmitt Bill introduced in the previous Congress.
- o Should the Administration simultaneously consider private sector transfer of both civil weather and land remote sensing systems?
 - Transfer of the civil weather satellite program to the private sector would place more emphasis on the private sector and market forces in determining the level and scope of these satellite activities. However, the assertion that such a transfer could reduce the Federal budget and increase the Federal tax base without incurring significant additional Federal risks has not yet been validated.
 - The Administration probably will not be able to determine if such a private sector transfer can be achieved on terms acceptable to the Government until proposals are received and evaluated.
- o The sub-issues that will need serious review and consideration include:
 - What type of Federal commitment, if any, would be appropriate for purchase of either weather and/or land satellite data? To what extent should the Federal Government continue related technology development (e.g., R&D on advanced sensors)?
 - What type of relationship should exist between the Government and any potential private sector owner/operator?
 - What Federal assets and data rights should the Government consider transferring to the private sector?

Budget Assumptions

- o In light of the need for fiscal restraint, an increase in the Federal commitment to land remote sensing from space should be considered only to the extent that user agencies are willing to make tradeoffs against previously approved activities for 1983 and beyond in order to facilitate an expanded Federal commitment.
- o Since there are other options for reducing the Federal expenditures for needed weather satellite data (e.g., combining civil/military polar-orbiting satellites, reducing the number of civil weather satellites in orbit, and placing weather sensors on commercial communications satellites), it should be assumed that the 1983-86 budget projections for civil weather satellites may be revised downward.

The agencies affected include:

<u>Agency</u>	<u>Area Affected</u>
Department of Commerce	NOAA operation of weather and land satellite systems.
Department of Agriculture	Agriculture forecasting based on weather and land satellite data.
Department of Defense	Data from civil weather satellites (in addition to data from military weather satellites).
Department of Interior	Geological, mineral, and land management activities use land satellite data.
Department of State	International agreements on satellite remote sensing.
Central Intelligence Agency	National security.
National Aeronautics and Space Administration	R&D using satellite data and new sensor development for weather and land satellites.

CHARTER OF

THE LAND REMOTE SENSING SATELLITE ADVISORY COMMITTEE

Establishment:

The Secretary of Commerce, having determined that it is in the public interest in connection with the performance of duties imposed on the Department by law and by the President's Directive of November 16, 1979, on Civil Operational Remote Sensing, and with the concurrence of the Administrator, GSA, hereby establishes the Land Remote Sensing Satellite Advisory Committee (the "Committee") pursuant to the Federal Advisory Committee Act, 5 U.S.C. App. (1976).

Objectives and Duties:

1. The Committee will advise the Secretary of Commerce on matters pertinent to the Department's responsibilities for the establishment and management of the civil operational land remote sensing satellite program.
2. The Committee will draw on the expertise of its members, the public and other sources as appropriate in order to provide advice and make recommendations to the Secretary on such matters as (a) identifying data requirements and establishing priorities for data requirements of the non-Federal user community; (b) establishing policies for the conduct of the program, including pricing policies for data

and standard data products, and (c) evaluating proposals for eventual private sector ownership of the land remote sensing satellite system.

3. The Committee will function solely as an advisory body, and will comply fully with the provisions of the Federal Advisory Committee Act.

Members and Chairperson:

1. The Committee shall consist of 15 members to be appointed by the Secretary to assure a balanced representation among the interested domestic non-Federal communities including state and local governments, users of land remote sensing satellite data, the value-added services industry, the academic community, the aerospace industry and potential commercial owners and investors in the program.

2. The Chairperson will be designated by the Secretary from among the members of the Committee.

3. The members will be appointed for staggered two-year terms and serve at the discretion of the Secretary. Initial one-year appointments may be made in order to achieve staggered terms. Vacant appointments shall be for the remainder of the unexpired term of the vacancy.

Administrative Provisions:

1. The Committee will report to the Secretary through the Administrator of NOAA.

2. The Committee will meet no more than every three months, except that additional meetings may be called as deemed desirable by the Secretary or by the Chairperson.

3. The National Earth Satellite Service of NOAA will provide clerical and other necessary supportive services for the Committee.

4. Members of the Committee will not be compensated for their services, but will, upon request, be allowed travel expenses as authorized by 5 U.S.C. § 5701 et seq.

5. The annual cost of operating the Committee is estimated at \$80,000. This includes a three-quarters personyear of staff support.

6. The Committee may establish such subcommittees of its members as may be necessary, subject to the provisions of the DCC Committee Management Handbook (Part II, Chapter 1, Section E).

Duration:

The Committee shall terminate 2 years from the date of this charter unless earlier terminated or renewed by proper authority by appropriate action.

AUG 12 1981

Date


Assistant Secretary for Administration

Pursuant to subsection 9(c) of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), this charter was filed with the Assistant Secretary for Administration on August 12, 1981. On the same date, copies were filed with the following committees of Congress, and a copy furnished the Library of Congress:

- Senate Committee on Commerce, Science, and Transportation
- House Committee on Energy and Commerce
- House Committee on Science and Technology

August 12, 1981
Date

Marilyn S. McLennan
Marilyn S. McLennan, Chief
Information Policy Division
Office of Organization and
Management Systems



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL EARTH SATELLITE SERVICE
Washington, D.C. 20233

June 1982

LAND REMOTE SENSING SATELLITE ADVISORY COMMITTEE

The Secretary of Commerce, Malcolm Baldrige, appointed the following members to the advisory committee on April 27, 1982, and designated Mr. Michel Halbouty as the Chairman. This 15-member committee was established in accordance with the Federal Advisory Committee Act of 1976 and includes representatives of industry, state government, and the academic community, who will advise the Department of Commerce on management of the U.S. civil operational land remote sensing satellite (Landsat) program. The Committee will report to the Secretary through the Administrator of the National Oceanic and Atmospheric Administration (NOAA), the agency responsible for Landsat operations beginning in January 1983.

State Government

1. Mr. James Sawy
Director, Division of Policy
Development and Planning
Office of the Governor
Juneau, Alaska
 2. Honorable A.J. Spano
Colorado House of Representatives
State Capitol
Denver, Colorado
-
- End-User Industry
3. Mr. G. R. Barker
Manager, Forest Resource Information
Systems
St. Regis Paper Company
Jacksonville, Florida
 4. Mr. Michel T. Halbouty (Chairman)
Consulting Geologist and Petroleum
Engineer
The Halbouty Center
Houston, Texas
 5. Mr. John Carter
Manager, Remote Sensing
Westwood Energy, Inc.
Arlene, Texas
-
- Value-Added Services Industry
6. Mr. J. Robert Porter, Jr.
President
Earth Satellite Corporation
Creek Chase, Maryland
 7. Mr. Vern Cartwright
Chairman
Cartwright Aerial Surveys, Inc.
Sacramento, California
-

Academic Community

8. Dr. Hugo John
Director, School of Natural Resources
University of Vermont
Burlington, Vermont
 9. Dr. Thomas Lillesand
Director, Remote Sensing Laboratory
University of Minnesota
St. Paul, Minnesota
-
- Aerospace Industry

10. Mr. Warren Nichols
Vice President and Director of
Engineering
Santa Barbara Research Center
Goleta, California
 11. Dr. E. M. Cortright
President
Lockheed California Company
Burbank, California
-
- Potential Commercial Owners and Investors

12. Mr. Donn Walklet
President
Terra-Mar Associates
Los Altos, California
 13. Mr. Raymond O'Connor
Executive Vice President
Bache Halsey Stuart Shields, Inc.
New York, New York
-
- General

14. Mr. John Alsop
Chairman of the Board of Directors
The Covenant Group
Hartford, Connecticut
15. Dr. Fred Harrison
President
Service Associates, Inc.
New Bern, North Carolina



DEPARTMENT OF COMMERCE
CHAPTER OF
ADDITIONAL MEMBERS PROPOSED

James V. Taranik
Dean, Mackay School of Mines
University of Nevada Reno
Reno, Nevada 89557

Floyd F. Sabins, Jr.
Chevron Oil Field Research
Box 446
La Habra, California 90631

Fred Henderson, III
The Geosat Committee
153 Kearny Street, Suite 209
San Francisco, California 94108

DEPARTMENT OF COMMERCE

CHARTER OF

THE PROGRAM BOARD ON CIVIL OPERATIONAL
LAND REMOTE SENSING FROM SPACEA. Establishment and Purposes

The Program Board on Civil Operational Land Remote Sensing from Space (hereafter Board) hereby is established by the Secretary of Commerce (Secretary) for continuing Federal coordination and regulation with respect to the Secretary's management and operation of a civil operational land remote sensing satellite system (hereafter land system) and such other civil land satellite matters on which the Secretary seeks the advice of the Board.

The land system will be a national program providing services to a broad spectrum of United States users of land remote sensing satellite data, with due regard given to the requirements of foreign users of the data. Individuals serving on the Board will act in two capacities: In addition to representing their respective agencies, they will assist in the formulation of goals and requirements for the program from a national viewpoint.

B. Functions1. National Policies

The Board shall assist in the formulation of goals and requirements for the land system from a national viewpoint with respect to such matters as:

- a. Policy issues related to budgeting, implementation and management, including, but not limited to, data and pricing policies;
- b. Overall land system performance standards and benefits;
- c. Federal uses for data and data products;
- d. Legislation and regulations;

- e. Procedures and policies for tasking the satellite and ground processing system;
- f. Policy issues related to international affairs;
- g. Policy issues related to national security;
- h. Proposals for ownership and operation of the land system by the private sector;
- i. Research and development to be requested by the Secretary from the National Aeronautics and Space Administration; and
- j. Other matters as appropriate.

2. Federal Information and Coordination

Through the Board, member agencies shall provide, as appropriate, information regarding the planning and operation of the land system, including but not limited to:

- a. Program and budgetary justifications needed to obtain authorization and funds;
- b. Requirements of Federal users for services, as well as those requirements and interests of non-Federal users, both domestic and international which relate to the missions and activities of member agencies;
- c. Other Federal programs insofar as they relate to the land system; and
- d. Other sources of remotely sensed land data.

3. Referral of Unresolved Policy Issues

The Board will refer any unresolved policy issues to the Secretary, who will convene a meeting of the appropriate Secretarial officers and Administrators, to consider the issues and take action.

C. Membership and Chair

1. The members of the Board shall be Federal officers at the assistant secretary level or agency equivalents, from the Departments of Agriculture, Commerce, Defense, Energy, the Interior and State, and from the Agency for International Development, the U.S. Army Corps of Engineers-Civil Works, the Director of Central Intelligence, the Environmental Protection Agency, and the National Aeronautics and Space Administration. The Executive Office of the President shall be represented as appropriate.

2. The Secretary shall designate an officer of NOAA at the assistant secretary level or above to chair the Board.

D. Administration

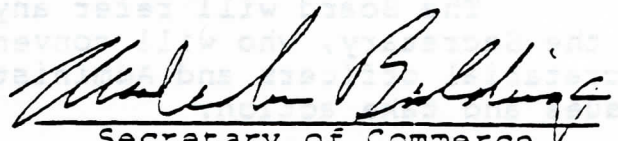
1. The Board shall meet at the call of the Chairman, or of any member, but at least three times during each fiscal year. NOAA shall provide facilities and staff support for the Board.

2. The Board may establish working groups of the Board, or of various members, to examine particular issues of interest to the Board.

E. Duration

The charter will be reviewed by the Board every two years and appropriate recommendations regarding its renewal will be made to the Secretary.

Date: JUN 24 1981


Secretary of Commerce

RESOLUTIONS BY THE

LAND REMOTE SENSING SATELLITE ADVISORY COMMITTEE

WHEREAS: The remote sensing of the earth, its oceans, and its atmosphere holds great promise as a technology vital to the future welfare of mankind, and

WHEREAS: This technology is yet in its infancy on the time scale of complex scientific applications, and

WHEREAS: These facts are well accepted by the scientific community,

BE IT RESOLVED THAT: No action be taken by the U.S. Government that will jeopardize the ongoing U.S. programs in these areas or the potential future fruits of the hard won progress to date.

WHEREAS: Administration policy is that all or part of the civil land remote sensing satellite program, its development and applications should be transferred to private industry as soon as possible, and

WHEREAS: The expense and risk of such a venture by private industry may as yet be excessive and require the continued leadership of Government on behalf of the public,

BE IT RESOLVED THAT: The Department of Commerce shall formally test the feasibility of transferring all or part of its civil land remote sensing satellite and weather satellite programs to private industry, and

THAT: The following procedure be followed:

1. The Department of Commerce shall identify its ongoing civil remote sensing programs and future plans, the cost

of existing and contracted hardware, the cost of existing and contracted supporting facilities, and the direct and indirect operating costs.

2. Private industry shall be invited to study these programs and program assets and the present and future opportunities to develop a profitable business by acquisition of all or part of them.
3. Interested participants will report to the Department of Commerce and this Committee, within ninety days of the invitation, the results of these studies, the recommended options, and the terms and conditions under which they would be interested in competing for them.
4. Based on the extent of the interest shown and the capability of private industry to pursue these programs at a level commensurate with public as well as private interest, the Committee will advise the Secretary of Commerce on the feasibility and the appropriateness of the transfer to private ownership of civil satellite remote sensing programs, and the manner in which this could be accomplished.

DATE: September 3, 1982

TO: U.S. Department of Commerce
Office of Field Operations
Commerce Business Daily Section
PO Box 5999
Chicago, Illinois 60680

Transmittal No: 1298

US Department of Commerce, NOAA/National Earth Satellite Service,
Washington, D.C. 20233

· M--CIVIL OPERATIONAL REMOTE SENSING FROM SPACE

The Secretary of Commerce is examining two issues with regard to the nation's civil remote sensing satellites:

1. What is the best mechanism to implement the current policy of transfer of civil land remote sensing systems (LANDSAT) to the private sector as soon as possible?
2. Should the Administration consider simultaneously private sector transfer of both civil weather and land remote sensing systems? (At this time, Administration policy is that civil weather satellite systems should remain in the Government.)

To assist in the process, the Secretary is requesting that the views of private industry be obtained. These views will be analyzed by the Administration and its advisory committee. This committee includes private sector representatives. Based in part on the results of this process, it is planned that a formal Request for Proposals will be prepared.

Private sector representatives are invited to present their views and expressions of interest on ownership and/or operation of

the land and weather satellites and the likelihood of Government savings in either mode and the mechanisms for transfer of these systems to the private sector. All or part of the information provided will be treated as confidential to the extent permitted by law. Offerors should clearly mark those pages of their response that contain proprietary information. The response may include both, either, or any part of either system. The desired information includes:

1. A statement of the recommendations and rationale for transfer of all or any part of these satellite systems.
2. A discussion of the technical and business aspects of any proposed transfer, with particular emphasis on continuity of service and the cost savings to the Government.
3. A description of the terms and conditions that are necessary for a successful transfer. This should include, but not necessarily be limited to:
 - a. Any desirable or undesirable Government regulation.
 - b. Any need for legislation.
 - c. Use of Government facilities, ground stations, and equipment.
 - d. Services to be provided to the Government and public.
 - e. Time frame in which transfer is considered feasible.
4. A description of the proposed remote sensing system and its capabilities (area of coverage, spatial resolution, sensor frequency bands, interval between repeat coverages of a ground site, etc.), including plans regarding direct transmission of data to foreign ground stations and distribution of data to international and domestic customers.

5. Anticipated evolution of new or improved sensing capabilities under the proposed transfer, and recommendations for a means to assure that evolution in any contractual or regulatory vehicle.
6. Response to foreign competition and its effects.
7. Potential for commercial international joint ventures in remote sensing and their implications in the areas of export control and national security.
8. If transfer is recommended for all or part of the civil weather satellite systems, information should be supplied on:
 - a. Assumption of command and control by the Department of Defense in emergencies.
 - b. Effect of providing selected priority service to defense needs when required.
 - c. Feasibility and savings associated with combining weather and land satellite functions (space and/or ground segment), and recommendation.
 - d. Use of existing Government facilities, ground stations, and equipment inventory.
 - e. Use of existing industry facilities, ground stations, and equipment inventory.
 - f. Proposed criteria for launching replacement satellites and selection of orbital parameters.
 - g. Weather satellite service costs under the proposed transfer to permit comparisons with current costs.

- h. A statement of the pricing and data distribution practice (domestically and internationally) that would be employed for weather data.
- i. Intended approach to the evolution of sensor systems still in an R&D stage, such as the VAS on the geostationary weather satellites.
- j. Approach to be used with foreign-supplied instruments, such as the ARGOS and SSU on the polar-orbiting weather satellites.
- k. Approach to respond to the National Weather Service priorities for severe storm data (National Severe Storms Forecast Center in Kansas City and National Hurricane Center in Miami) and for major forecast operations (National Meteorological Center in Camp Springs, Maryland).

A briefing package on the civil remote sensing satellites has been prepared and interested parties may obtain it from Mr. Robert L. Birchfield, Director of Resources and Management Services, National Earth Satellite Service/NOAA, Washington, D.C. 20233. His telephone number is (301) 763-2690. A conference will be held for industry at 9:30 a.m. on September 17, 1982, in Room 4830 of the Herbert C. Hoover Building (formerly the Commerce Building), 14th & Constitution Avenue, N.W., Washington, D.C. Firms planning to attend the conference should notify Mr. Robert L. Birchfield of their intent and the number of persons attending.

Offerors should submit 25 copies of their response to Dr. John H. McElroy, Assistant Administrator for Satellites, National

Earth Satellite Service/NOAA, Washington, D.C. 20233, no later than October 22, 1982. Dr. McElroy's phone number is (301) 763-5240. This request for information does not commit the Government to pay any costs incurred for the preparation of a response.

Queries may be addressed to either of the above.

This request for information is not subject to the normal clearance functions required in Sec. 3506(c)(5) of P.L. 96-511 (Paperwork Reduction Act).

Ralph P. Conlin
Contracting Officer

DATE:

TO: U.S. Department of Commerce
Office of Field Operations
Commerce Business Daily Section
PO Box 5999
Chicago, Illinois 60680

Transmittal No: _____

US Department of Commerce, NOAA/National Earth Satellite Service,
Washington, D.C. 20233

M--CIVIL OPERATIONAL REMOTE SENSING FROM SPACE

The notice published September 10, 1982, is amended to include the following Preamble:

It is the policy of this Administration to seek commercialization of Governmental activities which are not uniquely Governmental in nature since private enterprise is the primary source of our national economic strength.

The United States Government currently operates civil satellite systems to collect and disseminate remotely sensed weather and land satellite data. This data is used by numerous departments and agencies to perform Government services and is used by the private sector to extract information valuable in that sector. Civil satellite remote sensing is an activity which has a potential for substantially greater commercialization. Private entities have expressed interest in providing the remotely sensed satellite data that is needed by the Government and non-Government users on a commercial basis. The Land Remote Sensing Advisory Committee is currently soliciting other expressions of interest from the private sector for ownership and/or operation.

While it is the current policy of the Administration to seek prompt commercialization of land satellite remote sensing and to retain the civil weather satellites in the Government, that policy will be reexamined if commercialization of both systems is shown to produce cost savings to Federal agencies.

A conference for industry will be held at 9:30 a.m. on September 17, 1982, in Room 4830 of the Herbert C. Hoover Building (formerly the Commerce Building), 14th & Constitution Avenue, N.W., Washington, D.C. Firms planning to attend the conference should notify Mr. Robert L. Birchfield of their intent and the number of persons attending.

This request for information is not subject to the normal clearance functions required in Sec. 3506(c)(5) of P.L. 96-511 (Paperwork Reduction Act).

Ralph P. Conlin
Contracting Officer

EMBARGOED FOR RELEASE AT 10:00 A.M., PACIFIC TIME, JULY 4, 1982

Office of the White House Press Secretary

THE WHITE HOUSE

FACT SHEET

National Space Policy

The President announced today a national space policy that will set the direction of US efforts in space for the next decade. The policy is the result of an interagency review requested by the President in August 1981. The ten-month review included a comprehensive analysis of all segments of the national space program. The primary objective of the review was to provide a workable policy framework for an aggressive, farsighted space program that is consistent with the Administration's national goals.

As a result, the President's Directive reaffirms the national commitment to the exploration and use of space in support of our national well-being, and establishes the basic goals of United States space policy which are to:

- strengthen the security of the United States;
- maintain United States space leadership;
- obtain economic and scientific benefits through the exploitation of space;
- expand United States private sector investment and involvement in civil space and space related activities;
- promote international cooperative activities in the national interest; and
- cooperate with other nations in maintaining the freedom of space for activities which enhance the security and welfare of mankind.

The principles underlying the conduct of the United States space program, as outlined in the Directive are:

- The United States is committed to the exploration and use of space by all nations for peaceful purposes and for the benefit of mankind. "Peaceful purposes" allow activities in pursuit of national security goals.

- The United States rejects any claims to sovereignty by any nation over space or over celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right to acquire data from space.

- The United States considers the space systems of any nation to be national property with the right of passage through and operation in space without interference. Purposeful interference with space systems shall be viewed as an infringement upon sovereign rights.

- The United States encourages domestic commercial exploitation of space capabilities, technology, and systems for national economic benefit. These activities must be consistent with national security concerns, treaties and international agreements.

- The United States will conduct international cooperative space-related activities that achieve scientific, political, economic, or national security benefits for the nation.

- The United States space program will be comprised of two separate, distinct and strongly interacting programs-- national security and civil. Close coordination, cooperation and information exchange will be maintained among these programs to avoid unnecessary duplication.

- The United States Space Transportation System (STS) is the primary space launch system for both national security and civil government missions. STS capabilities and capacities shall be developed to meet appropriate national needs and shall be available to authorized users -- domestic and foreign, commercial and governmental.

- The United States will pursue activities in space in support of its right of self-defense.

- The United States will continue to study space arms control options. The United States will consider verifiable and equitable arms control measures that would ban or otherwise limit testing and deployment of specific weapons systems, should those measures be compatible with United States national security.

SPACE TRANSPORTATION SYSTEM

The Directive states that the Space Shuttle is to be a major factor in the future evolution of United States space programs, and that it will foster further cooperative roles between

the national security and civil programs to insure efficient and effective use of national resources. The Space Transportation System (STS) is composed of the Space Shuttle, associated upper stages, and related facilities. The Directive establishes the following policies governing the development and operation of the Space Transportation System:

- The STS is a vital element of the United States space program, and is the primary space launch system for both United States national security and civil government missions. The STS will be afforded the degree of survivability and security protection required for a critical national space resource. The first priority of the STS program is to make the system fully operational and cost-effective in providing routine access to space.

- The United States is fully committed to maintaining world leadership in space transportation with a STS capacity sufficient to meet appropriate national needs. The STS program requires sustained commitments by each affected department or agency. The United States will continue to develop the STS through the National Aeronautics and Space Administration (NASA) in cooperation with the Department of Defense (DoD). Enhancement of STS operational capability, upper stages and methods of deploying and retrieving payloads should be pursued, as national requirements are defined.

- United States Government spacecraft should be designed to take advantage of the unique capabilities of the STS. The completion of transition to the Shuttle should occur as expeditiously as practical.

- NASA will assure the Shuttle's utility to the civil users. In coordination with NASA, the DoD will assure the Shuttle's utility to national defense and integrate national security missions into the Shuttle system. Launch priority will be provided for national security missions.

- Expendable launch vehicle operations shall be continued by the United States Government until the capabilities of the STS are sufficient to meet its needs and obligations. Unique national security considerations may dictate developing special purpose launch capabilities.

- For the near term, the STS will continue to be managed and operated in an institutional arrangement consistent with the current NASA/DoD Memoranda of Understanding. Responsibility will remain in NASA for operational control of the STS for civil missions and in the DoD for operational control of the STS for national security missions. Mission management is the responsibility of the mission agency. As the STS operations mature, the flexibility to transition to a different institutional structure will be maintained.

- Major changes to STS program capabilities will require Presidential approval.

THE CIVIL SPACE PROGRAM

In accordance with the provisions of the National Aeronautics and Space Act, the Directive states that the civil space program shall be conducted:

- To expand knowledge of the Earth, its environment, the solar system and the universe;
- to develop and promote selected civil applications of space technology;
- to preserve the United States leadership in critical aspects of space science, applications and technology; and
- to further United States domestic and foreign policy objectives.

The Directive states the following policies which shall govern the conduct of the civil space program:

- United States Government programs shall continue a balanced strategy of research, development, operations, and exploration for science, applications and technology. The key objectives of these programs are to: (1) preserve the United States preeminence in critical space activities to enable continued exploitation and exploration of space; (2) conduct research and experimentation to expand understanding of: (a) astrophysical phenomena and the origin and evolution of the universe through long-lived astrophysical observation; (b) the Earth, its environment, its dynamic relation with the Sun; (c) the origin and evolution of the solar system through solar, planetary, and lunar sciences and exploration; and (d) the space environment and technology to advance knowledge in the biological sciences; (3) continue to explore the requirements, operational concepts, and technology associated with permanent space facilities; (4) conduct appropriate research and experimentation in advanced technology and systems to provide a basis for future civil applications.

- The United States Government will provide a climate conducive to expanded private sector investment and involvement in space activities, with due regard to public safety and national security. These space activities will be authorized and supervised or regulated by the government to the extent required by treaty and national security.

- The United States will continue cooperation with other nations in international space activities by conducting joint scientific and research programs, consistent with technology transfer policy, that yield sufficient benefits to the United States, and will support the public, nondiscriminatory direct readout of data from Federal civil systems to foreign ground stations and the provision of data to foreign users under specified conditions.

- The Department of Commerce, as manager of Federal operational space remote sensing systems, will: (1) aggregate Federal needs for these systems to be met by either the private sector or the Federal government; (2) identify needed research and development objectives for these systems; and (3) in coordination with other departments or agencies, provide regulation of private sector operation of these systems.

THE NATIONAL SECURITY SPACE PROGRAM

The Directive states that the United States will conduct those activities in space that it deems necessary to its national security. National security space programs shall support such functions as command and control, communications, navigation, environmental monitoring, warning, surveillance and space defense. The Directive states the following policies which shall govern the conduct of the national security program:

- Survivability and endurance of space systems, including all system elements, will be pursued commensurate with the planned use in crisis and conflict, with the threat, and with the availability of other assets to perform the mission. Deficiencies will be identified and eliminated, and an aggressive, long-term program will be undertaken to provide more-assured survivability and endurance.

- The United States will proceed with development of an anti-satellite (ASAT) capability, with operational deployment as a goal. The primary purposes of a United States ASAT capability are to deter threats to space systems of the United States and its Allies and, within such limits imposed by international law, to deny any adversary the use of space-based systems that provide support to hostile military forces.

- The United States will develop and maintain an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to United States space systems.

- Security, including dissemination of data, shall be conducted in accordance with Executive Orders and applicable directives for protection of national security information and commensurate with both the missions performed and the security measures necessary to protect related space activities.

INTER-PROGRAM RESPONSIBILITIES

The Directive contains the following guidance applicable to and binding upon the United States national security and civil space programs:

- The national security and civil space programs will be closely coordinated and will emphasize technology sharing within necessary security constraints. Technology transfer issues will be resolved within the framework of directives, executive orders, and laws.

- Civil Earth-imaging from space will be permitted under controls when the requirements are justified and assessed in relation to civil benefits, national security, and foreign policy. These controls will be periodically reviewed to determine if the constraints should be revised.

- The United States Government will maintain and coordinate separate national security and civil operational space systems when differing needs of the programs dictate.

POLICY IMPLEMENTATION

The Directive states that normal interagency coordinating mechanisms will be employed to the maximum extent possible to implement the policies enunciated. A Senior Interagency Group (SIG) on Space is established by the Directive to provide a forum to all Federal agencies for their policy views, to review and advise on proposed changes to national space policy, and to provide for orderly and rapid referral of space policy issues to the President for decisions as necessary. The SIG (Space) will be chaired by the Assistant to the President for National Security Affairs and will include the Deputy Secretary of Defense, Deputy Secretary of State, Deputy Secretary of Commerce, Director of Central Intelligence, Chairman of the Joint Chiefs of Staff, Director of the Arms Control and Disarmament Agency, and the Administrator of the National Aeronautics and Space Administration. Representatives of the Office of Management and Budget and the Office of Science and Technology Policy will be included as observers. Other agencies or departments will participate based on the subjects to be addressed.

BACKGROUND

In August 1981, the President directed a National Security Council review of space policy. The direction indicated that the President's Science Advisor, Dr. George Keyworth, in coordination with other affected agencies, should examine whether new directions in national space policy were warranted. An interagency working group was formed to conduct the study effort and Dr. Victor H. Reis, an Assistant Director of the Office of Science and Technology Policy was designated as Chairman. The group addressed the following fundamental issues: (1) launch vehicle needs; (2) adequacy of existing space policy to ensure continued satisfaction of United States civil and national security program needs; (3) Shuttle organizational responsibilities and capabilities; and, (4) potential legislation for space policy. The reports on the various issues formed the basis of the policy decisions outlined here. The following agencies and departments participated: State, Defense, Commerce, Director of Central Intelligence, Joint Chiefs of Staff, Arms Control and Disarmament Agency and the National Aeronautics and Space Administration, as well as, the National Security Council Staff and the Office of Management and Budget.

INTANGIBLE AND TANGIBLE BENEFITS OF LAND AND WEATHER SATELLITES

Experience with analyses and routine use of Landsat data has demonstrated the potential value of the derived information in establishing important national and international policies; in promoting vigorous U.S. energy, minerals, and agricultural industries; in improving the management of resources on public lands; and in supporting the economic and national security interests of the nation. Some of these benefits are available today because the derived data have been used. Some are potential because routine use has not yet been fully implemented. Some are tangible in that they are measurable in economic terms. Others are intangible because the value of improved information in policy and decision-making cannot be measured in terms of dollars.

Improved Information on Global Crop Production

International trading of agricultural products is an important element in this nation's balance of payments. In 1981, U.S. agricultural exports contributed about \$44 billion to the balance of payments. Global, timely, and reliable information on major food and fiber crops, in terms of stocks on hand, domestic consumption and export needs, expected production and future supply are significant national economic parameters. Landsat data, in conjunction with data from weather satellites, present the potential for improving the accuracy and timeliness of information on foreign production over that available with conventional data alone. The value of such information can be traced across a broad spectrum of public and private sector activities.

Droughts, floods, severe storms, insect and disease infestations, and shortages of fertilizers and pesticides can have dramatic effects on crop production. These events occur in agricultural areas around the world with disturbing regularity. Satellites can provide data which, with continued development of applications technology, will permit reliable detection of these events or their effects on crop production.

For over 50 years the export of surplus U.S. agricultural productivity has been a major factor in global commerce and in improving the U.S. balance of payments. Perhaps more importantly, it has become a major tool of U.S. foreign policy. Food shipments feed the starving, improve the standard of living in developing nations, and help to overcome the effects of major floods, droughts, and similar events.

Analysis of Landsat data contributes significantly to providing information that is invaluable in a variety of nonquantifiable ways, such as:

- o Landsat data are particularly valuable, and indeed are a unique source of information, over areas of the world where other information sources are not available. For example, Landsat data are a major source contributing to information on foreign crop conditions where agricultural reporting systems are rudimentary or nonexistent.
- o In the area of food shipments to avoid starvation, early detection of conditions using satellite data permits the timely development of sensible relief supply strategies to meet the emergencies most efficiently.

Improved Information on Fuel and Nonfuel Minerals

The United States economy as we know it cannot survive without abundant supplies of nonrenewable resources. In 1980 the nation consumed over 2 billion tons of new nonfuel minerals and metals, 6 billion barrels of oil, 20 trillion cubic feet of gas, and 800 million tons of coal. The value of these raw supplies exceeded \$200 billion, and the processed value was over \$500 billion. More than one-third of our petroleum is imported, much of it from distant and unreliable sources. More than one-half of two dozen highly strategic materials comes from imports. In 1980, the United States spent \$5 billion to import non-fuel raw materials, \$25 billion for processed materials, \$72 billion for crude and refined petroleum and \$20 billion for natural gas, or a total of \$132 billion for these materials alone.

Military preparedness is dependent on a continuous supply of certain critical natural resources. Current U.S. reserves of several of these resources are at levels sufficiently low to warrant concern. For many highly strategic materials, there are no commercially exploitable reserves in the United States.

The next two decades will bring more uncertainty into the international market as more and more nations are involved in their own location and control of nonrenewable resources. There is some question whether there will be adequate supplies of these minerals to support a worldwide economic expansion. Both developing and developed countries will compete for the finite supplies of these resources. The U.S. must have knowledge of the location and availability of these nonrenewable resources. Landsat D and D' will contribute to obtaining this knowledge, but enhanced remote sensing capabilities offer the opportunity for even greater contributions.

That Landsat data are very valuable in locating new sources of nonrenewable resources has been documented. The U.S. minerals extraction industry is a strong advocate for continued and improved land remote sensing from space. In some cases, the use of Landsat data permits analyses in mineral prospecting that have never before been possible. In many areas of the world, other data collection methods are not possible for political or economic reasons. In still other cases, the use of Landsat data is simply a more cost-effective way to conduct preliminary geological surveys.

For some strategic minerals (e.g., chromium, platinum, and cobalt) the United States is almost totally dependent on supplies from only one or two nations. For a variety of political reasons, it is sometimes difficult for the United States to maintain relationships with these countries. Remote sensing can help identify potential new sources, if they exist.

U.S. industry now spends more than \$10 billion per year in the search for new mineral sources. Land remote sensing from space offers the opportunity to conduct those geological studies more economically and effectively.

Economic Studies on Landsat

Extensive studies have been conducted over the past decade on the economic value of the benefits accruing from an operational Landsat-type satellite system. These studies were conducted at considerable cost to the Federal

Government. Because of the many technical scenarios and assumptions on technological maturity of the data users, estimated U.S. benefits ranged from about \$130 million to as high as \$10 billion per year.

Three of these studies, those by the Earth Satellite Corporation, Econ, Inc., and Abt Associates, Inc., are highlighted here to indicate the range of potential benefits resulting from different program assumptions:

- o "Earth Resources Benefit Cost Study" by the Earth Satellite Corporation (ESC) with Booz-Allen Research Corporation, 1974

This study focused on the benefits likely from an operational system with characteristics similar to the first Earth Resources Technology Satellite (ERTS-1). The sensor proposed had 80-meter resolution with four spectral bands.

The study emphasized economic efficiency benefits--i.e., doing a current job more economically. While it considered impacts on social, environmental, and other unquantifiable uses, these applications did not receive equal priority with the benefits associated with economic efficiency. The study did not consider technological improvements in remote sensing or information extraction capabilities.

This eight-year-old study estimated the annual benefits (adjusted for inflation) in 1985 to be between \$129 and \$137 million to the U.S. The study concluded that major benefits would be from use in water resource and rangeland management, land use, and technology export. While this study also examined benefits from agricultural and mineral use, the benefits anticipated were one to two orders of magnitude less than from those applications discussed above.

- o "The Economic Value of Remote Sensing of Earth Resources from Space," by Econ, Inc., 1974

This study also based its conclusion on a satellite with 80-meter resolution data, but assumed the addition of a thermal IR channel (which was added to later Landsat satellites). Econ also based its conclusions on measurable benefits only but did consider potential benefits which result from assured continuity of data services, and from increased data use capability, recognizing that it could only provide order of magnitude values for them.

The Econ report, while written at the same time as the ESC report, concluded that agricultural applications would produce the major benefits, accounting for about half of the totals estimated. Econ stated that the balance of the benefits would accrue primarily from the same user areas in the ESC report--i.e., water resources and rangeland management and land use.

The Econ report estimated total annual benefits to be between \$3,272 million to \$6,280 million.

- o "Benefits, Risks, and Costs of a Civilian High Resolution Multispectral Satellite-Based Earth Resources Sensing System," by Abt Associated, 1981

In 1974, when the Econ and ESC studies were performed, the technology existed for much higher resolution remote sensing capability than the ERTS-1 satellite; however, these firms were not asked to consider this advanced capability in their benefit analysis. Abt considered this technology and based its study on a hypothetical 10-meter resolution multispectral capability. Abt believes that this higher resolution will be of very high economic value to demographic sensing and to energy resource explorations.

Because of this, Abt estimates the total global net annual economic benefit to range from \$30,000 million to \$35,000 million. Abt's more restrictive finding of U.S. benefits only is \$5,000 million to \$10,000 million. The cost of a 10-meter system would of course be much higher than an 80-meter system.

Most of Abt's higher estimates of benefits not only assume that there will be a continuity of data, but also that there will be a substantial effort in technology development, user education, and data marketing.

It is curious that none of these studies projected significant economic benefits from the use of Landsat data by the minerals extraction industry. This is in striking contrast with the strong support given by that industry to continue this U.S. technology, and with the fact that roughly thirty percent of the Landsat data sold to date from the archives has been to that industry. Perhaps this is because of the technological advances in use by the minerals industry since the major studies (ESC and Econ) were conducted in 1972-74.

These three studies demonstrated the wide range of potential annual benefits that can accrue to the nation from an operational land remote sensing system: between \$130 million and \$10 billion. All three studies project certain market reactions to the availability of improved information. None examines the incremental value of the information contributed by analysis of Landsat's multispectral data versus the value of the information from other intelligence sources.

The three studies do seem to indicate, however, that the value of the information extracted from Landsat data could be quite high. A major problem in benefit analysis is the explicit identification of which user benefits and by how much. Many segments of the U.S. economy stand to capture these benefits, but mechanisms do not now exist for the satellite operator to capture them as an inducement to invest. A long history of United States policy on public nondiscriminatory access to civil land remote sensing data could limit the ability of the private sector to treat basic data as proprietary as a mechanism to exploit derived information. Collection and public distribution of certain economic information, particularly in the area of global agricultural production by Government agencies under legislative mandate prevents the private owner/operator from capturing a major share of the benefits attributable to renewable resource applications, although this could be changed by legislation. A significant change in U.S. policy on public nondiscriminatory access to civil

satellite data would likely mitigate against international acceptance of the freedom of the U.S. to collect satellite data over other nations for peaceful purposes. Such a change in the U.S. position could be detrimental to United States civil and national security satellite programs. On the other hand, for commercialization to become a reality, it may be necessary to examine options to enhance markets for Landsat data.

The policy of public nondiscriminatory availability of civil land remote sensing data does provide for open access to the Landsat system. It is unclear, however, whether this policy would preclude certain categories of data from being treated as proprietary. For example, under a private system, proprietary rights may be granted to users for discrete scenes acquired on a special basis that would not otherwise have been collected.

Under this scheme, a user would pay the operator an extra fee for the special acquisition of a particular scene or scenes. In exchange, the user would be granted exclusive use of that unique piece of data for some specified period of time (six months, one year, etc.). At the end of that interval, the scene would be available for public purchase. This provision would not preclude the collection of data over the same geographic area subsequent to the original special acquisition. It would simply limit, for a period of time, the purchase of that specific scene by a third party.

This activity would not necessarily change significantly the policy of public nondiscriminatory availability. The operator would make this special service available to all on a first-come-first-served basis and provide nondiscriminatory access to all data acquired regularly and that which is no longer under exclusive use by a special requestor. Third parties may not have immediate access to specially requested data; however, the current policy of public nondiscriminatory availability makes no guarantees concerning timeliness. One could also argue that more data would be available under this scheme since there would be an increased incentive for parties to request data that otherwise would not be acquired and hence lost forever.

In short, one cannot assume a priori that a private operator is precluded from at least offering to users some type of proprietary rights for certain data. As long as those rights are available to all and apply only to specific data for a limited period of time, public nondiscriminatory access to the civil land system is not significantly compromised. Consequently, an important commercial tool, proprietary rights, may not be available to the potential operator per se but to its users, thus enhancing to a degree the viability of the Landsat market.

Thus, a large degree of uncertainty exists as to the viability of the private Landsat market. At the other end of the spectrum is the market for environmental data. Here the market is assured because of the operational use of the data in many areas by the Federal Government.

Within NOAA, satellite data from both the polar orbiting and geostationary satellite systems play a major role in the National Weather Service's increasingly accurate and timely forecasts and warnings over the United States. These data are indispensable in providing prompt warnings of severe weather events and in preparing more reliable longer term weather forecasts.

Civil and military weather satellite systems are complementary and mutually supportive. Both communities operate polar orbiting systems designed to meet the unique needs of their respective service communities. Satellite data are shared between the civil and military users. NOAA, the U.S. Air Force, and the U.S. Navy have recently embarked on a formal shared data processing program. The Department of Defense makes significant use of capabilities of NOAA's geostationary weather satellites.

The Departments of Agriculture and Interior, the Corps of Engineers and others share hydrological data collected in regional networks of rainfall gauges and stream flow gauges operated by each agency to meet its particular needs. These data are collected by NOAA's geostationary weather satellites and are provided to the various Federal and state agencies concerned with flood forecasting, flood control, irrigation, and fresh water management.

Increasingly, the Department of Agriculture and other agencies use NOAA weather satellite imagery and data, along with Landsat data, in forecasting production of wheat and other crops of great importance in international commodities trading.

National aviation weather forecast and dissemination responsibilities are shared between NOAA and the Federal Aviation Administration. NOAA's international aviation weather forecast area of responsibility meshes with those of other nations under the International Civil Aviation Organization. Civil weather satellites provide data that are indispensable in these aviation services.

Weather services provided by the private sector are based on NOAA's weather satellite images and data, basic weather products, and conventional global weather data.

Almost all the governments of the world have freely exchanged weather data analyses and forecasts for over a hundred years. For almost 20 years the international data exchange has included weather satellite data. Both civil and military weather services in the United States would be impacted if foreign satellite and nonsatellite data either were no longer available or available at a cost the Federal Government could not afford.

Thus, a ready, but principally Government, market exists for these data. It is argued by some that, by combining the Landsats and environmental satellites into a single transfer to the private sector, sufficient efficiencies and revenues can be achieved to sustain both systems at a considerable savings to the Government. This implies large waste in the current system and the feasibility of combining ground and/or satellite systems to generate the funds to sustain Landsat. This will have to be examined thoroughly if such an assertion is made. Alternatively, in the event a large savings were not available, an untested, but plausible, premise is that simply increasing the cost of weather satellite data to support Landsat--i.e., cross-subsidizing--would be unacceptable to Federal weather data users.

It seems likely that, following current trends, agencies would have to budget individually for the data they receive. In that event, however, the issue of how a business could be assured of a secure base from which to build becomes fairly complex. A variety of mechanisms can be imagined that would

meet the private sector's needs, but their political palatability is another question. For example, one way to meet a private entity's needs would be a long-term guaranteed revenue contract made up of the comparatively stable amount for weather services and an initial subsidy to sustain Landsat. At the end of some term, the subsidy could be reevaluated. This would remove the firm's revenues from the annual budget cycle, but might be vigorously opposed by various budget offices for the same reason.